

Appendix A

- (i) Amendments in marked-up form to
Claims 2 and 24~27,
 - (ii) New Claims 54~82, and
 - (iii) Current status of all other claims
-

1. (original) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

2. (currently amended) The process of Claim 1 wherein, when said material is separated from said electron field emitter, a portion of said electron field emitter is removed.

3. (original) The process of Claim 2 wherein said acicular emitting substance is acicular carbon.

4. (original) The process of Claim 3 wherein said acicular carbon is comprised of carbon nanotubes.

5. (original) The process of Claim 4 wherein said carbon nanotubes are single wall carbon nanotubes.

6. (original) The process of Claim 5 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

7. (original) The process of Claim 3 wherein said acicular carbon is comprised of carbon fibers grown from the catalytical decomposition of carbon-containing gases over small metal particles, each of which said fibers has graphene platelets arranged at an angle with respect to the fiber axis so that the periphery of said carbon fiber consists essentially of the edges of said graphene planes.

8. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

b 9. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 5 wt % of the total weight of said electron field emitter.

10. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 1 wt % of the total weight of said electron field emitter.

11. (original) The process of Claim 5, wherein said carbon nanotubes are about 0.1 wt % to about 2 wt % of the total weight of said electron field emitter.

12. (original) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter such that said force fractures said electron field emitter thereby forming a new surface of said electron field emitter.

13. (original) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance,

comprising applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter wherein said force results in the removal of a portion of said electron field emitter thereby forming a new electron field emitter surface.

14. (original) The process as in Claims 12 or 13, wherein the acicular emitting substance is acicular carbon.

15. (original) The process of Claim 14 wherein said acicular carbon is comprised of carbon nanotubes.

16. (original) The process of Claim 15 wherein said carbon nanotubes are single wall carbon nanotubes.

17. (original) The process of Claim 16 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

18~23. *cancelled*
(~~withdrawn~~)

24. (currently amended) An electron field emitter comprised of an acicular emitting substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12-~~or~~, 13, 60, 61, 62, 63, 64, 65, 66, 67 or 68.

25. (currently amended) An electron field emitter comprised of acicular carbon ~~carbon~~ wherein the emission of said acicular carbon has been improved by the process of Claim 3.

26. (currently amended) An electron field emitter comprised of carbon ~~carbon~~ nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

27. (currently amended) An electron field emitter comprised of single wall carbon nanotubes wherein the emission of said single

wall carbon nanotubes has been improved by the process of any one of Claims ~~45 or 8-11~~ 5 or 8-11.

28. (original) An electron field emitter comprised of carbon fibers grown from the catalytical decomposition of carbon-containing gases over small metal particles, each of which said fibers has graphene platelets arranged at an angle with respect to the fiber axis so that the periphery of said carbon fiber consists essentially of the edges of said graphene planes wherein the emission of said carbon fibers has been improved by the process of Claim 7.

29. (original) An electron field emitter comprised of acicular carbon wherein the emission of said acicular carbon has been improved by the process of Claim 14.

b 30. (original) A field emission triode with an electron field emitter comprised of an acicular emitting substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12 or 13.

31. (original) A field emission triode with an electron field emitter comprised of acicular carbon wherein the emission of said acicular emitting substance has been improved by the process of Claim 3.

32. (original) A field emission triode with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

33. (original) A field emission triode with an electron field emitter comprised of single wall carbon nanotubes wherein the emission of said single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

34. (original) A completely screen-printed field emission triode with an electron field emitter comprised of an acicular emitting

substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12 or 13.

35. (original) A completely screen-printed field emission triode with an electron field emitter comprised of acicular carbon wherein the emission of said acicular emitting substance has been improved by the process of Claim 3.

36. (original) A completely screen-printed field emission triode with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

b 37. (original) A completely screen-printed field emission triode with an electron field emitter comprised of single wall carbon nanotubes wherein the emission of said of single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

38. (original) A lighting device with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

39. (original) A lighting device with an electron field emitter comprised of single wall carbon nanotubes wherein the emission of said of single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

40~53. ^{cancelled}
~~(withdrawn)~~

54. (new) The process of Claim 1 wherein the electron field emitter is rearranged, and little or none of the electron field emitter is removed.

55. (new) The process of Claim 4 wherein said carbon nanotubes are multiwall carbon nanotubes.

56. (new) The process of Claim 5 further comprising multiwall carbon nanotubes.

57. (new) The process of Claim 12 or 13 wherein said acicular emitting substance comprises multiwall carbon nanotubes.

58. (new) The process of Claim 16 further comprising multiwall carbon nanotubes.

59. (new) The process of Claim 12 or 13 wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

b 60. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, wherein there is no translational motion by the material with respect to the electron field emitter, and wherein said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

61. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) contacting a liquid material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from

said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

62. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) contacting a material with said electron field emitter before said electron field emitter is fired, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

63. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, consisting essentially of:

(a) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

64. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field

emitter, before said electron field emitter is fired, such that said force fractures said electron field emitter thereby forming a new surface of said electron field emitter.

65. (new) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter, before said electron field emitter is fired, wherein said force results in the removal of a portion of said electron field emitter thereby forming a new electron field emitter surface.

66. (new) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of the electron field emitter comprising:

(a) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(b) separating said material from said electron field emitter.

67. (new) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of the electron field emitter, comprising applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter such that said force fractures said electron field emitter thereby forming a new surface of said electron field emitter.

68. (new) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising applying a force to the surface of said

electron field emitter in a direction essentially normal to the plane of the electron field emitter wherein said force results in the removal of a portion of said electron field emitter thereby forming a new electron field emitter surface.

69. (new) The process of Claim 60, 61, 62, 63 or 66 wherein, when said material is separated from said electron field emitter, a portion of said electron field emitter is removed.

70. (new) The process of any one of Claims 60~68 wherein said acicular emitting substance is carbon nanotubes.

71. (original) The process of Claim 70 wherein said carbon nanotubes are single wall carbon nanotubes.

B 72. (original) The process of Claim 71 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

73. (new) The process of Claim 70 wherein said carbon nanotubes are multiwall carbon nanotubes.

74. (new) The process of Claim 71 further comprising multiwall carbon nanotubes.

75. (original) The process of Claim 70 wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

76. (new) The process of Claim 1, 60, 62, 63 or 66 wherein the material is applied in liquid form.

77. (new) The process of Claim 61 wherein the material is applied in liquid form and is heated.

78. (new) The process of Claim 76 wherein the material is applied in liquid form and is heated.

79. (new) The process of Claim 1, 60, 61, 62, 63 or 66 wherein the material is thermally softened polymer film.

80. (new) The process of Claim 79 wherein the material is selected from the group consisting of an acrylic film, an ethylene/acrylic elastomer film, a block copolymer film and an ionomer film.

81. (new) The electron field emitter of Claim 24 which has acicular particles protruding from the surface thereof.

82. (new) A process for improving emission current density of a carbon nanotube electron field emitter, said process comprising the steps of:

(a) forming a carbon nanotube layer by screen-printing a carbon nanotube paste through a patterned screen onto a substrate, wherein a plurality of conductive pattern is formed thereon so as to form a field emission display device;

(b) performing a drying process to said substrate;

(c) performing a firing process; and

(d) performing a taping process.
